

*References teaches that
LED generates heat,*

DOCUMENT-IDENTIFIER: US 20030063462 A1

TITLE: Illumination light
source

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Detail Description Paragraph - DETX (104):

[0144] One or more LED chips 72 can be arranged on the heat-dissipating substrate 73, and typically about 10 to 200 can be provided. In this embodiment, the LED chips 72 are bare chips.

If the LED chips 72 are thermally coupled to the heat sink 74, then the heat sink 74 can contribute to dissipating the heat generated by the LED chips 72. As a result, the lifetime of the LED chips 72 can be increased. Examples of a substrate suitable for use as the heat-dissipating substrate 73 include glass epoxy substrates, composite substrates and ceramic substrates. Preferably, these substrates include a metal base, which further improves the heat dissipation performance. Moreover, these substrates also can be multi-layered substrates.